

WHAT IS CLAIMED IS:

1. A motor control apparatus that controls a motor by using a position loop and a velocity loop according to a position signal and a position deviation signal, the position signal  
5 being information on a rotational position of the motor driving an object to be controlled, and the position deviation signal being a difference between the position signal and a position instruction signal designating a rotational position of the motor, the motor control apparatus comprising:

10 a current limiting unit that limits an output current to the motor and outputs a current limiting signal, when the output current is limited;

a deviation limiting unit that obtains an input/output deviation of the position deviation signal when the current  
15 limiting signal is outputted and a velocity control operation is performed, and outputs the input/output deviation; and

an integrating unit that integrates the input/output deviation,

wherein when each of a velocity instruction signal and  
20 an acceleration/deceleration instruction signal is detected from the position instruction signal, an integral value of the input/output deviation signal is subtracted from the position deviation signal.

25 2. The motor control apparatus according to claim 1,

wherein in a case where an output of the deviation limiting unit increases even when the integral value of the input/output deviation signal is subtracted from the position deviation signal during acceleration information represents a positive value, the output of the deviation limiting unit is not increased; and

in a case where the output of the deviation limiting unit decreases even when the integral value of the input/output deviation signal is subtracted from the position deviation signal during the acceleration information represents a negative value, the output of the deviation limiting unit is not decreased.

3. The motor control apparatus according to claim 1, further comprising:

a position-within-one-revolution correction control unit that controls a position-within-one-revolution of the motor when the current limiting signal is not present.

4. The motor control apparatus according to claim 3,

wherein the position-within-one-revolution correction control unit outputs a position-within-one-revolution correction amount as an acceleration/deceleration pattern.

5. The motor control apparatus according to claim 3,

wherein the position-within-one-revolution correction control unit determines an acceleration and a maximum velocity of an acceleration/deceleration pattern at acceleration according to a torque characteristic of the motor, and outputs  
5 a position-within-one-revolution correction amount as the acceleration/deceleration pattern.

6. The motor control apparatus according to claim 3,

wherein the deviation limiting unit sets, when switching  
10 between wires is performed in response to a motor winding switching request, an output value thereof at a value that causes a velocity deviation signal to become 0.

7. The motor control apparatus according to claim 3, further  
15 comprising:

a position loop model unit that outputs an ideal position of the motor, which is determined according to the position instruction signal from an equivalent position control system including a characteristic of the object to be controlled;

20 a position correction unit enabled to select a signal of a deviation between an output value of the position loop model unit and an actual position signal of the motor, and a signal of a difference between the position instruction signal and a limited output thereof; and

25 a switch that inputs an input signal to be inputted to

the deviation limiting unit to the position correction unit in a case where the signal of the difference between the position instruction signal and the limited output thereof is selected and where the current limiting signal is present.

5

8. The motor control apparatus according to claim 1, wherein in a case where a signal indicating that control of a motor position-within-one-revolution is unnecessary is inputted, a correction position deviation amount is set to be

10 0.

9. The motor control apparatus according to claim 1, further comprising:

an electric current limit value control unit that changes  
15 a maximum value of an electric current limit value when the motor is accelerated or decelerated in a case where a correction position deviation amount is equal to or more than a predetermined value.

20 10. A motor control method for controlling a motor by using a position loop and a velocity loop according to a position signal and a position deviation signal, the position signal being information on a rotational position of the motor driving an object to be controlled, and the position deviation signal  
25 being a difference between the position signal and a position

instruction signal designating a rotational position of the motor, the motor control method comprising:

a step of limiting an output current to the motor and outputting a current limiting signal when the output current is limited;

a step of obtaining an input/output deviation of the position deviation signal when the current limiting signal is outputted and a velocity control operation is performed, and outputting the input/output deviation;

a step of integrating the input/output deviation; and

a step of subtracting, when each of a velocity instruction signal and an acceleration/deceleration instruction signal is detected from the position instruction signal, an integral value of the input/output deviation signal from the position deviation signal.

11. The motor control method according to claim 10,

wherein in a case where an output of the deviation limiting unit increases even when the integral value of the input/output deviation signal is subtracted from the position deviation signal during acceleration information represents a positive value, the output of the step of outputting is not increased; and

in a case where the output of the deviation limiting unit decreases even when the integral value of the input/output

deviation signal is subtracted from the position deviation signal during the acceleration information represents a negative value, the output of the step of outputting is not decreased.